

REMARKS

Reconsideration is respectfully requested in view of any changes to the claims and the remarks herein. Please contact the undersigned to conduct a telephone interview in accordance with MPEP 713.01 to resolve any remaining requirements and/or issues prior to sending another Office Action. Relevant portions of MPEP 713.01 are included on the signature page of this amendment.

The title has been changed as suggested by the Examiner.

Claim Rejections - 35 USC § 112

Claims 30 through 32, 47 and 49 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants have amended the claims to clarify the language in response to the Examiner's comments and respectfully request the rejection be withdrawn in view thereof.

In Claims 30 and 31, the phrase of "a texture" (line 2) has been changed to "the texture."

In Claim 32, the dependence has been changed so that claim 32 depends from claim 30 and thus there is antecedent basis for phrase "the embossing."

In Claim 47 the term "the layer" has been added to clarify the claim in response to the Examiner's comments.

In Claim 49 the phrase "the surface layer" has been changed to "the layer" to provide positive antecedent basis.

Claims 37, 38 and 39 have been amended to change "contact tip" to "contact tip structure" to provide proper antecedent basis.

In claim 45 the term "element" has been added to provide proper antecedent basis.

In claim 52 the term "bending" has been changed to "bonding" to correct a typographical error.

Claim Rejections - 35 USC §102

Claims 29, 31, 33 through 35, 37, 43 and 45 have been are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al. 4,637,130 and Queyssac et al. 5,089,877.

Applicants respectfully disagree.

At page 4 of the Office Action the Examiner states, "Fujii discloses a process of fabricating an electrical interconnection element having a contact tip structure." Applicants respectfully disagree that Fujii teaches a "contact tip structure" as claimed by applicants. The Examiner further states In regard to the teaching of Fujii that Fujii teaches a "contact tip structure comprising: forming a contact tip structure (e.g. 2, 6, 15, 16 in Fig. 5A) on a sacrificial substrate (e.g. 9 or 17)." Applicants respectfully disagree that Fujii teaches a method using a sacrificial layer as recited in applicants' claims. Fujii at Col. 3 lines 39-42 teaches:

"FIGS. 5A and 5B are views illustrating the structure of a lead frame according to the present invention in which FIG. 5A is a plan view thereof and FIG. 5B is a sectional view thereof ... Two strips 15 and 16 extend from a side of the substrate support 2 which opposes the side to which the external lead 6 is connected. The strips 15 and 16 are connected to a second connecting band 17. Apertures 18 formed on the second connecting band 17 serve to fit with part of a mold for alignment in the plastic encapsulation process. As shown in FIG. 5B, the thickness of the strips 15 and 16 is smaller than that of the substrate support 2. A

predetermined step is formed between the lower surfaces of the strips 15 and 16 and the lower surface of the substrate support 2.(Emphasis added.)

And Fujii Col. 4, lines 8010, teaches:

The first and second connecting bands 9 and 17 are clamped by the upper and lower molds 13 and 14, as described above. (Emphasis added.)

Applicants note that Fujii refers to Fujii element 2 as a “substrate support.” The Examiner does not explain how a Fujii “substrate support” is a “contact tip element” recited in applicants’ claims. Applicants note that Fujii refers to Fujii elements 15 and 16 as “strips [that] extend from a side of the substrate support.” The Examiner does not explain how the Fujii “strips 15 and 16” are “contact tip elements” as recited in applicants’ claims. Applicants note that Fujii refers to Fujii elements 9 and 17 as a “connecting bands.” The Examiner does not explain how a Fujii “connecting band” is a “contact tip element” as recited in applicants’ claims. Fujii elements 2, 6, 9, 15, 16 and 17 in Fujii Fig. 5A are all part of a single unitary lead frame and are not referred to as a “contact tip element” as recited in applicants’ claims. The Examiner has not shown how Fujii teaches “forming a contact tip structure on a sacrificial substrate” as recited in the first clause of applicants’ claim 29 from which all the claims under examination depend.

The examiner further states that Fujii teaches, “prior to constructing the contact tip structure, providing a texture (i.e. either one of pit, raised contact surface, surface layer, or surface material) in an area of the sacrificial substrate, which is formed with the texture.” The Examiner does not identify where Fujii teaches a “texture in an area of the sacrificial substrate” as recited in applicants’ claims or where Fujii teaches that “a texture” is a pit, raised contact surface, surface layer, or surface material. The terms “texture,” “pit,” “raised contact surface,” “surface layer,” or “surface material” do not appear in Fujii. Thus the Examiner has not made out a prima facie case of anticipation of claims 29, 31, 33, 35, 37, 43 and 45. The Examiner must identify where every element of the claim is taught in the reference for the reference to anticipate the claim.

The Examiner further states that Fujii teaches:

attaching an electrical interconnection element (e.g. 1) to the contact tip structure to form a first structure (see Fig. 6).

Fujii Fig. 6 shows element 1 disposed on element 2. But the Examiner does not identify what in Fujii Fig. 6 corresponds to “a texture in an area of the sacrificial substrate, where the contact tip structure is formed on the area of the sacrificial substrate which is formed with the texture” as recited in applicants’ claims. The Examiner does not show what corresponds to “a texture” in Fig. 6. Thus the Examiner has not made out a prima facie case of anticipation. Moreover, Fujii Col. 3 lines 8 teaches “transistor element 1.” The Examiner does not explain how a transistor element is “an electrical interconnection element” as recited in applicants’ claims which recite in the preamble of claim 29 “[a] method of fabricating an electrical interconnection element having a contact tip structure.” A person of ordinary skill in the art would understand “an electrical interconnection element” as an element that makes electrical interconnection between things. Since applicants’ claims recite “attaching an electrical interconnection element to the contact tip structure to form a first structure,” the “electrical interconnection element” makes electrical interconnection between the “contact tip structure” and something else. The Examiner does not explain how the Fujii transistor 1 provides electrical interconnection between the “contact tip structure” (alleged by the Examiner to be Fujii 2, 6, 15, 6 of Fig. 5A) and something else. The Examiner does not explain how the transistor 1 of Fujii provides this function. The field of the invention of Fujii is describes at Col. 1, lines 11-12 as “[t]he present invention relates to a method for manufacturing a plastic encapsulated semiconductor device” which is not “[a] method of fabricating an electrical interconnection element having a contact tip structure” as recited in applicants’ claims. Thus the Examiner has not made out a prima facie case of anticipation. Moreover, Fujii Fig. 6 shows “transistor element 1” covered by Fujii element 5, Fujii Col. 2., lines 42-43 teaches “[r]eference numeral 5 denotes a protective plastic portion.” The Examiner does not explain how a Fujii “transistor element 1” covered with a Fujii

“protective plastic portion 5” is an “electrical interconnection element” as recited in applicants’ claims.

The Examiner further states Fujii teaches:

a first structure (Fig. 6) having the electrical interconnection element and the contact tip structure;

The Examiner presumably means that Fujii element 1 is disposed on Fujii element 2 in Fujii Fig. 6. But the Examiner does not identify what in Fujii corresponds to “a texture” as recited in applicants’ claims.

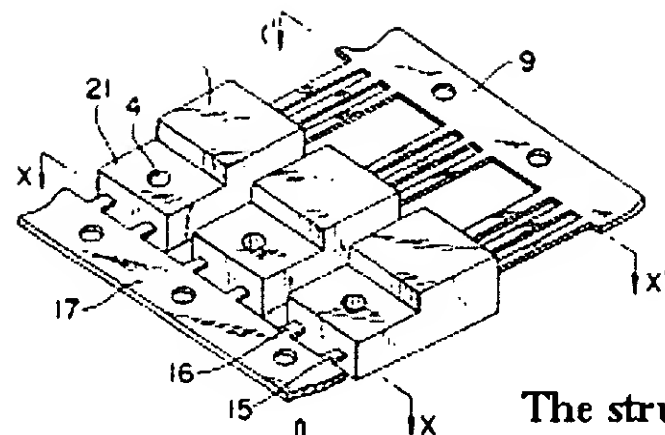
The Examiner further states Fujii teaches:

and then removing the contact tip structure from the sacrificial substrate (in sequence of Figs. 7 and 8),

Applicants respectfully disagree that Fujii teaches “removing the contact tip structure from the sacrificial substrate” as recited in applicants’ claims. As noted above the Examiner does not show where Fujii teaches “a texture.” In regard to Fujii Figs. 7 and 8, Fujii teaches at Col. 4, lines 25-28 “[t]he strips 15 and 16 and the first connecting band 9 are cut along the line X--X and the line X'--X', respectively.” Based on the Examiner’s statements above Fujii 9 and 17 are what the Examiner considers to be the “sacrificial substrate” recited in applicants’ claims. In lines 4-5 claim 29 recites “providing a texture in an area of the sacrificial substrate.” The Examiner does not identify where along the lines X--X or X'—X' in Fujii Fig. 7 there is a texture in elements 9 and 17 of Fujii Fig. 7 and correspondingly how in Fujii Fig. 7 “the contact tip structure [identified by the Examiner above as Fujii elements 2, 6, 15 and 16] ... is formed with the texture” by being “formed on the area of the sacrificial substrate” which has been provided with “a texture in an area of the sacrificial substrate” as recited in applicants’ claims.

Fuji et al.

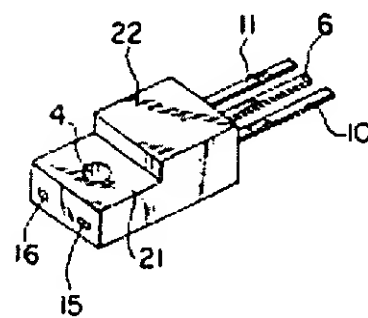
FIG. 7



The structure of Fuji Fig. 7 is cut along lines X-X and X'-X' to get the structure of Fuji Fig. 8 .

Fuji et al.

FIG. 8



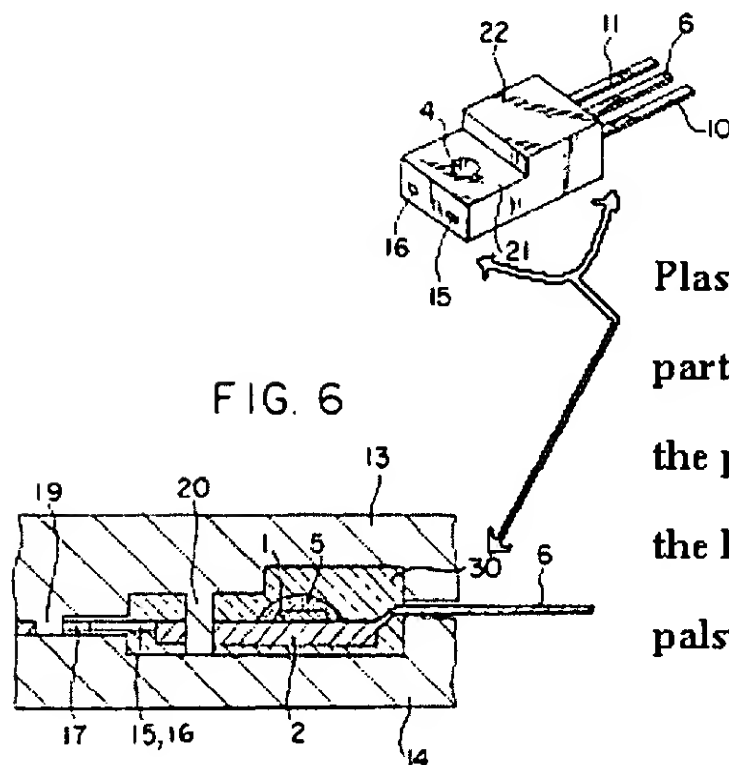
The Examiner concludes at the end of the first paragraph of page 4 of the Office Action that the teaching of Fujii "meets all of the limitations of the claimed manufacturing process." Applicants respectfully disagree for the reasons given above and respectfully request that the rejection be withdrawn.

The Examiner further states in the second paragraph of page 4 of the Office Action that "[t]he 'first structure' (in [Fujii] Fig. 8) is inherently compliant because of the free standing contact tip structure [identified by the Examiner above as Fujii elements 2, 6, 15 and 16]. As evidence of inherency, the examiner cites Queyssac, which states that free standing contact tip structures are 'compliant' (col. 8, lines 57-63)." At page 4, line 6, of the Office Action the Examiner identifies the entire structure in Fujii Fig. 6 as the "first structure" recited in applicants' claims and in the second paragraph of page 4 of the Office Action the Examiner identifies the entire structure of Fujii Fig. 8 as the "first

structure" recited in applicants' claims. The entire structure of Fujii Fig. 6 cannot be compliant because Fujii Fig. 6 teaches at Col. 3 lines 54- 59:

FIG. 6 is a view illustrating the state of plastic encapsulation of the transistor assembly formed by using the lead frame according to the present invention. The plastic 30 is injected into the cavity formed between the upper and lower molds 13 and 14 in the same manner as in the conventional plastic encapsulation

Fuji et al. FIG. 8

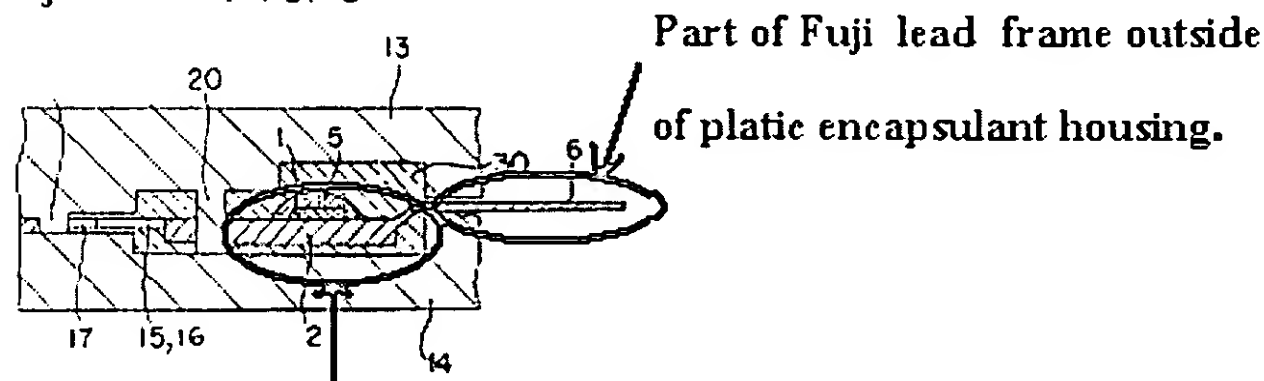


Plastic encapsulant enclosed transistor 1 and part of lead frame 2. Fuji does not teach that the plastic encapsulant is compliant. Part of the lead frame 6, 10, 11 extends out from the plastic encapsulant 30.

Fujii does not teach that the plastic is "compliant" as recited in applicants' claims. The last line of the Fujii abstract teaches a "plastic encapsulating housing". A person of ordinary skill in the art would understand that housing is to protect what is in the interior of the housing and thus would understand that the plastic is not compliant. As shown above the plastic housing (element 30 of Fujii Fig. 6 and elements 21 and 22 of Fujii Fig. 8) include Fujii element 1, called by Fujii Col 3, line 8, a "transistor element" (incorrectly referred to by the Examiner as "an electrical interconnection element" which is a term recited in applicants' claims) and a part of the lead frame (The Fujii Filed of the Invention is at Col. 1, lines 11-14, is "a method for manufacturing a plastic encapsulated

semiconductor device which can be used with relatively large power and a lead frame.”) Thus the Examiner’s statement in the second paragraph of page 4 of the Office Action that “[t]he ‘first structure’ (in [Fujii] Fig. 8) is inherently compliant because of the free standing contact tip structure [identified by the Examiner above as Fujii elements 2, 6, 15 and 16]” is inconsistent with the teaching of Fujii. Applicants’ claims recites “attaching an electrical interconnection element to the contact tip structure to form a first structure” and “the first structure is compliant after said removing of the contact tip structure.” Thus applicants’ claims recite “the first structure [i.e. the electrical interconnection element attached to the contact tip structure] is compliant.” What the Examiner identifies in Fujii as corresponding to “the first structure” of applicants’ claims is what is shown in Fujii Fig. 8 which is a transistor or semiconductor device encapsulated in plastic with a lead frame lead projecting out from it the only portion of which a person of ordinary skill in the art would understand to possibly be compliant is the portion of the lead frame projecting out of the plastic package.

Fuji et al. FIG. 6



Fuji element 1, a transistor element, and part of the lead frame, element 2, is within the plastic encapsulant housing 30.

As noted above the examiner states “[a]s evidence of inherency, the examiner cites Queyssac, which states that free standing contact tip structures are ‘compliant’ (col. 8, lines 57-63).” Queyssac col. 8, lines 57-63 teaches apparently referring to Fig. 18 thereof. (See Queyssac Fig. 18 below)

In the surface mount assembly 80, the conductive fingers 18 are integrally formed with external J-leads 82 which are preferably of the freestanding, compliant type which have an end portion 82A which is curled under the molded body 30 and is received within a pocket 84.

This passage teaches that the “external J-leads 82 ... are preferably of the freestanding, compliant type.” Queyssac Col. 5, lines 21-23, teaches “a molded body 30 of non-conductive material, for example a polymer such as polyetherimide or epoxy resin.” There is no teaching in Queyssac that “molded body 30” is compliant. Thus the Examiner appears to be stating that since the “external J-leads 82 ... which have an end portion 82A which is curled under the molded body 30” of Queyssac are compliant the straight external leads 6, 10 and 11 of Fujii are necessarily (inherently) compliant. Applicants respectfully disagree. This is a conclusory statement not supported by any facts. Whether a material is compliant depends on a number of factors such as the material composition and its physical dimensions. The Examiner has pointed to no facts to conclude that straight external leads 6, 10 and 11 of Fujii are necessarily (inherently) compliant..

Although the Examiner reject claim 31 as anticipated by Fujii the Examiner does not identify where Fujii teaches the limitations recited in claim 31 which is “providing a texture comprises forming a pit.” Thus the Examiner has not made a prima facie case of anticipation of claim 31 by Fujii.

Although the Examiner rejects claim 33 as anticipated by Fujii the Examiner does not specifically identify where Fujii teaches the limitations recited in claim 33 which is “the contact tip structure comprises a surface layer.” Thus the Examiner has not made a prima facie case of anticipation of claim 33 by Fujii.

Although the Examiner rejects claim 35 as anticipated by Fujii the Examiner does not specifically identify where Fujii teaches the limitations recited in claim 35 which is “the surface material comprises a material suitable for making contact with an electronic

component.” Thus the Examiner has not made a prima facie case of anticipation of claim 35 by Fujii. Claim 35 depends from claim 34 which is not rejected as anticipated by Fujii thus claim 35 cannot be anticipate by Fujii if claim 34 is not.

Although the Examiner rejects claim 37 as anticipated by Fujii the Examiner does not specifically identify where Fujii teaches the limitations recited in claim 37 which is “the contact tip structure comprises a protuberance.” Thus the Examiner has not made a prima facie case of anticipation of claim 37 by Fujii.

Although the Examiner rejects claim 43 as anticipated by Fujii the Examiner does not specifically identify where Fujii teaches the limitations recited in claim 43 which is “the contact tip structure comprises a an enlarged end.” Thus the Examiner has not made a prima facie case of anticipation of claim 43 by Fujii.

Although the Examiner rejects claim 45 as anticipated by Fujii the Examiner does not specifically identify where Fujii teaches the limitations recited in claim 45 which is “the electrical interconnection is elongated and provides the compliance of the first structure.” Thus the Examiner has not made a prima facie case of anticipation of claim 45 by Fujii.

In view of the remarks herein the Examiner is respectfully requested to withdraw the rejection of claims 29, 31, 33 through 35, 37, 43 and 45 under 35 U.S.C. 102(b) as being anticipated by Fujii et al 4,637,130 and Queyssac et al. 5,089,877.

Claim Rejections - 35 USC § 103

A

Claims 30 and 32 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al in view of Birglechner et al 3,967,366. Applicants respectfully disagree.

For the reasons given above applicants disagree with the examiners statement that "Fujii discloses the claimed manufacturing method as relied upon above in Claim 29." As noted above the terms "texture," "pit," "raised contact surface," "surface layer," or "surface material" do not appear in Fujii. Applicants claim 30 recites "providing the texture comprises embossing." The Examiner states "Fujii does not mention 'embossing'".

Fujii not only does not teach embossing it does not teach "providing a texture" as recited in applicants' claims. The Examiner further states: "Birglechner teaches providing a texture in an area of a sacrificial substrate (in Fig. 1) by embossing to form contact tip structures (col. 3, lines 39+)." Applicants respectfully disagree. Birglechner does not refer to the term "texture" and the Examiner does not identify where Birglechner teaches "providing a texture in an area of the sacrificial substrate" as recited in applicants' claim 30 through depending on claim 29. The Examiner provides no argument for why a person of skill in the art would use the embossing taught by Birglechner to provide a texture in an area of the sacrificial substrate by embossing as claimed by applicants claim 30. Thus the Examiner's statement that "Birglechner teaches providing a texture in an area of a sacrificial substrate (in Fig. 1) by embossing to form contact tip structures (col. 3, lines 39+)" is a conclusory statement.

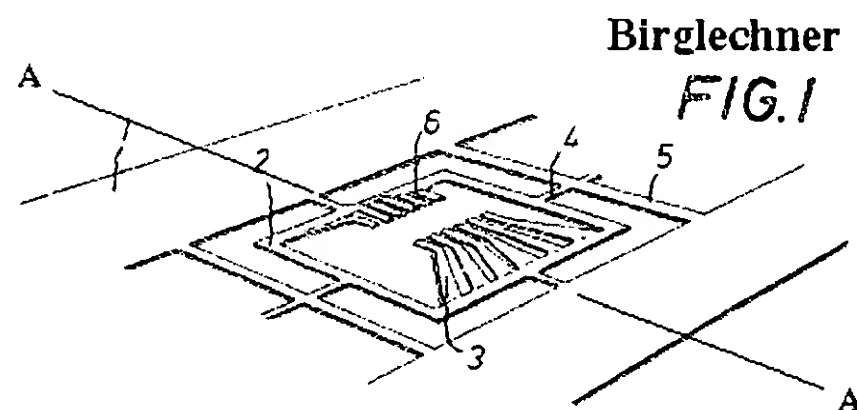
The only teaching of Birglechner directed to embossing is from Col , 3, lines 20-49:

A further important advantage of the method in accordance with the invention consists in that the second frame does not have to be adjusted quite exactly to the first frame, but a faulty adjustment by half a tongue width can be put up with. The contacting tongues of the second frame are preferably so pre-embossed that the height difference between the connection electrodes of the semiconductor body and the tongues of the first frame is equalized by the form of the embossing. As a result of this pre-embossing, mechanical damage by temperature dependent

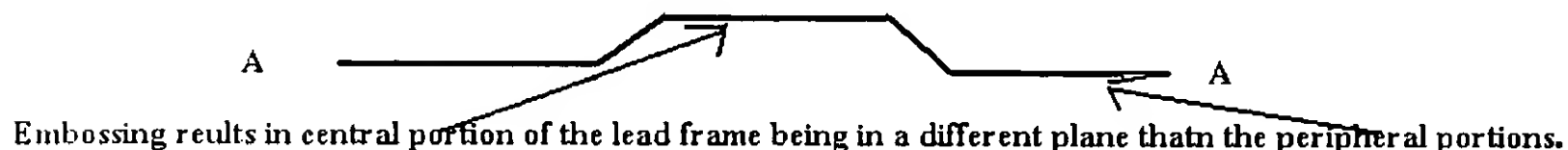
expansion is avoided, since this expansion can be equalized by the **embossing** curvature.

Referring now to the drawings, FIG. 1 shows the second contacting frame. This frame was etched into a metal strip which comprises for example a copper foil of between 35 to 50 μm thick. The contacting frame 2 has tongues 3 projecting into the interior, the free ends 6 of which tongues are provided for the wire-free connection to the electrodes of a semiconductor body. The frame 2 is connected by narrow webs 4 to outer side webs of the metal strip 1 and transverse webs 5. As a result of the extensive free etching of the frame, this frame can be very easily taken out of the carrier foil 1. In the case of the production stage shown in FIG. 1, the connection tongues 3 are already so provided with an **embossing** curvature by an **embossing** operation that the ends 6 project above the surface formed by the frame 2. The frame 2 and the associated tongues 3 are preferably tinned before or after the **embossing**. (Emphasis added.)

This is schematically shown by the following Figure based on Birglechner Fig. 1.



Schematic cross section along line A--A in Birglechner Fig. 1



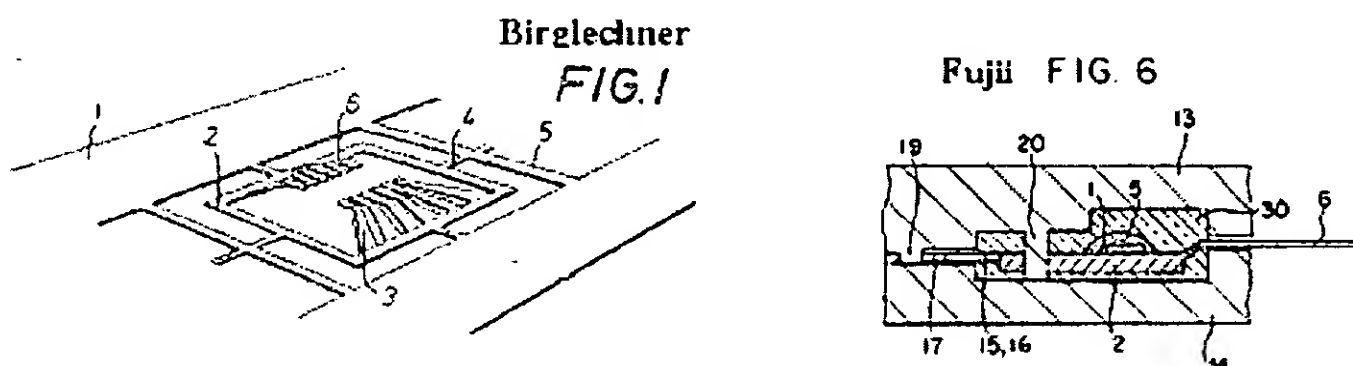
There is nothing in Birglechner Col , 3, lines 20- 49 directed to "providing a texture on an area or a sacrificial substrate, wherein the contact tip structure is formed on the area of the sacrificial substrate which is formed with the texture" as recited in

applicants' claims. The "embossing" of Birglechner is not taught by Birglechner to be used for "providing a texture in an area of the sacrificial substrate" as recited in applicants' claims and the Examiner does not identify any where such teaching can be found in Birglechner. Thus the Examiner's statement that "Birglechner teaches providing a texture in an area of a sacrificial substrate (in Fig. 1) by embossing to form contact tip structures (col. 3, lines 39+)" is a conclusory statement not supported by any teaching of Birglechner.

In the second paragraph of page 5 of the Office Action the Examiner states "[t]he sacrificial substrate of both Fujii and Birglechner are both known as conventional lead frames." The Examiner has not identified what the Examiner believes is the sacrificial substrate of Birglechner. As described above what the Examiner has identified as a sacrificial substrate in Fujii does not teach "providing a texture in an area of the sacrificial substrate" as claimed by applicants. Following the Examiner's comment that Fujii and Birglechner teach lead frames, then Birglechner would teach a lead frame having a sacrificial substrate of the same type as Fujii which the argument provided above shows does not teach "providing a texture in an area of the sacrificial substrate" as claimed by applicants and thus Birglechner does not teach "providing a texture in an area of the sacrificial substrate" as claimed.

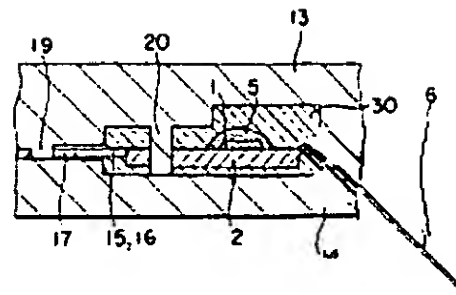
In the third paragraph of page 5 of the Office Action the Examiner states "[i]t would have obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Fujii by forming the texture with embossing, as taught by Birglechner, to form and shape art recognized equivalent sacrificial substrates (i.e. lead frames)." Applicants respectfully disagree. This is a conclusory statement not supported by the teaching of Fujii or Birglechner. As stated above the Examiner does not identify where Fujii or Birglechner teaches "providing a texture in an area of the sacrificial substrate" as recited in applicants' claims and the Examiner does not identify where Fujii or Birglechner teaches "the contact tip structure ... which is formed with the texture" as recited in applicants' claims. Thus the Examiner has not made out a prima facie case of obviousness in view of Fujii or Birglechner.

Although the Examiner has rejected claim 32 as obvious over Fujii and Birglechner the Examiner make not specific comments on claim 32 which recites "[t]he method according to claim 30 wherein the embossing comprises forming a raised contact surface." Claim 32 depends on claims 29 and 30. Claim 30 recites "providing the texture comprises embossing" and claim 29 recites "providing a texture in an area of the sacrificial substrate, wherein the contact tip structure is formed on the area of the sacrificial substrate which is formed with the texture." Thus according to applicants' claims the texture is on the sacrificial substrate where the contact tip structure is formed. The Examiner does not identify where Fujii or Birglechner teaches this. Although Birglechner teaches embossing, the Examiner does not identify how the Birglechner teaching of embossing is relevant to providing the texture on the sacrificial substrate where the contact tip structure is formed as recited in applicants' claims. The Examiner has not made a prima facie case of obviousness of claim 30 and 32 in view of Fujii and Birglechner. For comparison Birglechner Fig. 1 and Fujii Fig. 6 are reproduced below.



Applying the teaching of Birglechner to the teaching of Fujii, Birglechner element 5 corresponds to Fujii element 2 and Birglechner element 6 corresponds to Fujii element 6 as shown in Birglechner Fig. 1 and Fujii Fig 6 above. Thus using the bent lead frame of Birglechner in the structure of Fujii leads to the structure shown below which is a modification of Fujii Fig. 6 wherein element 6 and 2 of Fujii has a curvature as does elements 5 and 6 of Birglechner.

Fujii FIG. 6



In view thereof applicants respectfully request that the rejection of claim 30 and 32 under 35 U.S.C. 103(a) as being unpatentable over Fujii et al in view of Birglechner et al 3,967,366 be withdrawn.

Claim Rejections - 35 USC § 103

B

Claims 36, 38 and 39 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Suzuki et al 3,778,887.

The Examiner states "Fujii discloses the claimed manufacturing method as relied upon above in Claims 29, 33, 34 and 37." Applicants respectfully disagree with this statement for the reasons given above. The Examiner states "Fujii does not mention that the contact tip surface material is gold (i.e. Au)."

The Examiner states at page 5, sixth paragraph:

However, gold is a conventional and notoriously well known conductive material to form contact tip materials of electrical interconnection devices. As evidence of obviousness, the examiner cites Suzuki (col. 4, lines 58-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the contact tip surface material of Fujii 7 by using gold, as taught by Suzuki, to allow conductivity of the contact tip structure and to improve corrosion proofness.

The Examiner has not shown where Suzuki teaches a texture as recited in applicants' claim 29 from which claims 36, 38 and 39 indirectly depend. Suzuki teaches at Col. 4, lines 66-68, "[a]s the plated metal film gold may be used for silver" for plating on a lead frame, but this has no relationship to a "a texture" as recited in each of applicants' claims. Applicants note that claim 38 which recites "the contact tip comprises gold" (claim 39 recites gold and other materials) depends from claim 37 which recites "the contact tip comprises a protuberance" which depends through claim 33 on claim 29 which recites "the contact tip ... which is formed with the texture." The Examiner has not identified where Fujii or Suzuki teaches "a texture." Thus the Examiner has not made out a prima facie case of obviousness of applicants' claims 36, 38 and 39 over Fujii and Suzuki.

In view of the remarks herein the Examiner is respectfully requested to withdraw the rejection of claims 36, 38 and 39 under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Suzuki et al 3,778,887.

Claim Rejections - 35 USC § 103

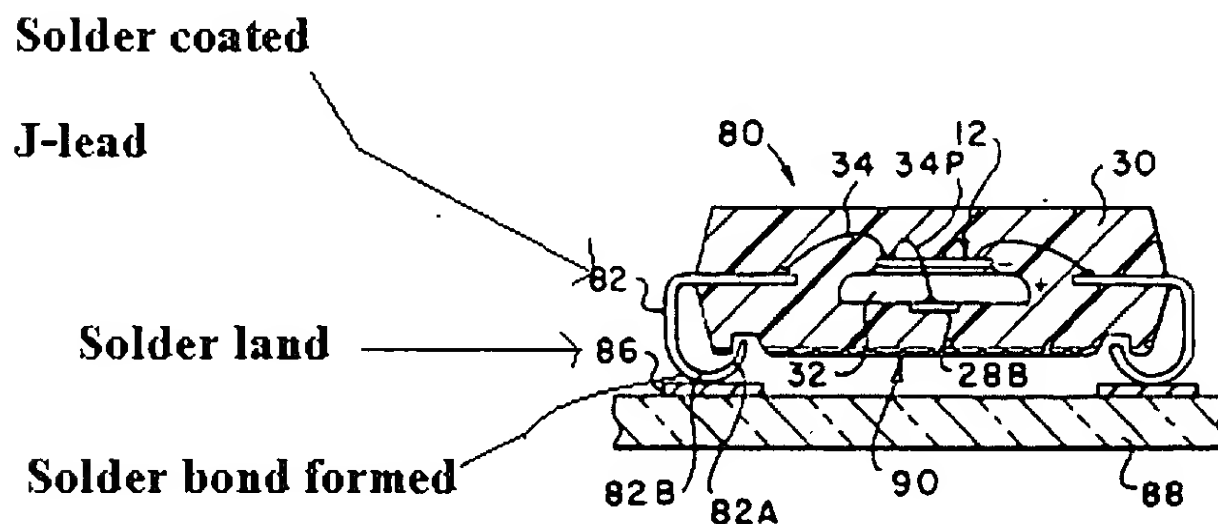
C

The Examiner states at page 5 second last paragraph, of the Office Action "Claims 40 through 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Queyssac 5,089,877[SIC]." The Examiner states in the last paragraph at page 5 of the Office Action "Fujii discloses the claimed manufacturing method as relied upon above in Claims 29 and 33." Applicants respectfully disagree for the reasons given above. The Examiner further states "Fujii does not mention that the contact tip comprises a bonding material. Queyssac shows that contact tip can include lead (i.e. Pb) 'bonding materials' to solder and bond the contact tip structures to other electrical devices (col. 9, lines 11+)." Applicants respectfully disagree. At page 4, Queyssac teaches at Col. 9, lines 3- 12:

The solder lands 86 are carefully aligned in a parallel, spaced pattern for surface contact by the curved portions of the J-leads 82. The J-leads 82 are each precoated

with solder. A solder joint is then formed at each J-lead/land interface by a batch soldering process, for example the dual-wave reflow soldering technique. During the reflow soldering process, the surface mount package 80 will be exposed to thermal radiation from the solder bath, which may be at or near 363 degrees F., for example the melting point of eutectic SN 63-Pb 36 solder.

Thus Queyssac teaches coating the J-leads 82 with solder to form solder bonds to solder lands 8 as shown in marked up Queyssac Fig. 18 below.



Queyssac FIG. 18

86 at this location.

The Examiner concludes in the second paragraph of page 6 of the Office Action "[i]t would have obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Fujii by adding the bonding material of Queyssac, to positively allow the contact tip structure to be bonded to other electrical devices." Applicants respectfully disagree for the reasons given above. Applicants also note that the Examiner does not identify where either Fujii or Queyssac teach "a texture" as recited in applicants' claims. The Examiner has not made out a case of prima facie obviousness of claims 40 through 42 over Fujii in view of Queyssac.

In view of the remarks herein the Examiner is respectfully requested to withdraw the rejection of claims 40 through 42 under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Queyssac

Claim Rejections - 35 USC § 103

D

The Examiner states at page 6, third paragraph of the Office Action: "Claims 44 and 46 through 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Abe 4,763,407." The Examiner further states " Fujii discloses the claimed manufacturing method as relied upon above in Claims 29 and 45." Applicants respectfully disagree for the reasons given above. The Examiner further states in the third and fourth paragraph at page 6 of the Office Action:

Fujii does not mention that the electrical interconnection structure is either an electrical conductor with a surface layer, or is a compliant core element and a layer. Abe shows an electrical interconnection element (e.g. 11 in Fig. 4) as a layer or surface layer. The wires 13 of Abe can be read as an "elongated electrical conductor" or "compliant core element", or alternatively as a "layer" or "surface layer". The wires of Abe are formed of the conventional material of Au (i.e. gold, col. 3, lines 4+).

Applicants respectfully disagree. The Examiner does not specifically identify what the Examiner is considering to be the "electrical interconnection structure." In the quoted passage above the Examiner incorrectly states "Abe shows an electrical interconnection element (e.g. 11 in Fig. 4) as a layer or surface layer." The sentence bridging Col 2 ad 3 of Abe teaches "[a] semiconductor element 11 is adhered on the upper surface of the circuit board 10 through an adhesive 11a." Thus Abe element 11 is not a surface layer but a semiconductor element. The Examiner further states in the passage quoted above "[t]he wires 13 of Abe can be read as an 'elongated electrical conductor' or 'compliant core element'", or alternatively as a "layer" or "surface layer." Applicants respectfully disagree with the Examiner's comments. The Examiner does not make clear how a

"wire," such as Abe element 13, can be a "layer" or a "surface layer." Applicants' claim 44 recites "the electrical interconnection element is an elongated electrical conductor" and the Examiner in the comments quoted above states "[t]he wires 13 of Abe can be read as an 'elongated electrical conductor.'" But the Examiner earlier in the passage quoted above (from page 6 of the Office Action) states, as noted above, the "electrical interconnection element" is Abe semiconductor 11. Thus the Examiner in the passage quoted above is inconsistently identifying an "electrical interconnection element" as Abe semiconductor 11 and Abe wire 13. Thus the Examiner has not made out a prima facie case of obviousness of applicants claims 44 and 46 through 52 as being unpatentable over Fujii et al. in view of Abe. Applicants in addition note that (as noted above) in rejecting applicants' claims 29, 31, 32 through 35, 37, 43 and 45 as anticipated by Fujii, the Examiner identified the "electrical interconnection element" recited in applicants' claims as Fujii transistor 1. This is inconsistent with the Examiner identifying the "electrical interconnection element" recited in applicants' claims 44 and 46 to 52 with Abe wire 13. This is another reason for why the Examiner did not, as noted above, make out a prima facie case of anticipation of applicants' claims 29, 31, 32 through 35, 37, 43 and 45 by Fujii:

In the last paragraph of page 7 of the Office Action the Examiner states:
It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electrical interconnection element of Fujii to adding the electrical conductor with a surface layer, or is a compliant core element with a layer, as taught by Abe, to allow the electrical interconnection element to be coupled and connected to other electrical devices.

The Examiner has not identified where Abe teaches that Abe wire 13 has a "surface layer" as recited in applicants' claim 44 or where Abe teaches that Abe wire 13 has "a layer on the core element" as recited in applicants' claim 46 to 51 (claims 48, 49, 50, 51 depend from claim 46.) The Examiner has said nothing about the limitations of claim 52 "said attaching is by a method selected from the group consisting of wire

bonding, solder bonding, and laser bonding.” Thus the Examiner has not made out a prima facie case of obviousness of claims 44 and 46 through 52 are under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Abe 4,763,407.

In view of the comments herein the Examiner is respectfully requested to withdraw the rejection of claims 44 and 46 through 52 are under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Abe 4,763,407.

In view of the changes to the claims and the remarks herein, the Examiner is respectfully requested to reconsider the above-identified application. If the Examiner wishes to discuss the application further, or if additional information would be required, the undersigned will cooperate fully to assist in the prosecution of this application.

Please charge any fee necessary to enter this paper and any previous paper to deposit account 09-0468.

If the above-identified Examiner's Action is a final Action, and if the above-identified application will be abandoned without further action by applicants, applicants file a Notice of Appeal to the Board of Appeals and Interferences appealing the final rejection of the claims in the above-identified Examiner's Action. Please charge deposit account 09-0468 any fee necessary to enter such Notice of Appeal.

In the event that this amendment does not result in allowance of all such claims, the undersigned attorney respectfully requests a telephone interview at the Examiner's earliest convenience.

MPEP 713.01 states in part as follows:

Where the response to a first complete action includes a request for an interview or a telephone consultation to be initiated by the examiner, ... the examiner, as soon as he or she has considered the effect of the response, should grant such request if it appears that the interview or consultation would result in expediting the case to a final action.

Respectfully submitted,

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